Problem-Solving Skill Prediction in the Context of Birth Order Using the Projective Art Assessment Person-Picking-An-Apple-From-A-Tree

Aubry DeFoe
Albertus Magnus College

To be Submitted in partial completion of the requirements for the degree of
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DATE: March 6, 2024

TO: Aubrey DeFoe
FROM: Albertus Magnus College Institutional Review Board
PROJECT TITLE: Problem-Solving Skill Prediction in the Context of Birth Order Using the Projective Art Assessment Person-Picking-An-Apple-From-A-Tree
IRB ID Number: 202324-027

SUBMISSION TYPE: New
DECISION: Approved with Conditions
ACTION: COMPLETE

Dear Aubrey DeFoe:
The Albertus Magnus College Institutional Review Board (AMCIRB) by Expedited Review has considered the New submission for the project referenced above. Following this review, the AMCIRB has **Approved with Conditions** this study, from 3/6/2024 to 3/6/2025.

Research activities (including screening, new recruitment, follow-up, and continued participation of enrolled participants) that have been approved may not be conducted beyond the expiration date stated above unless a continuation/renewal is requested and approved by the IRB.

While the decision indicates the research *may proceed*, please make the necessary revisions to all appropriate documents, or provide written justification for not doing so to fulfill the condition(s). Upon re-submission, the protocol will NOT be sent back to the Reviewer(s).

Conditions Requested:
- Section XI: Check "Yes" for Will Names be Recorded

- Write out the full name of acronyms used the first time they appear e.g. PPAT, FEATS, PSI

- Consent Form: Remove: Add Thesis Advisor to list of contacts; and Remove "… assisting a graduate student in the completion of her thesis requirement, as well as contributing to research on art therapy."

SUBMIT CHANGES AS FOLLOWS:

- Upload any requested new forms or documents to your Google Drive Folder of the original submission or send using the same mode as initial submission.
- Revise relevant, previously submitted documents (e.g. protocol, etc.) using the tracked change feature and rename document to include version number e.g. IRBapplication**_v2**
- Upload the tracked change version of the revised document to the Google Drive folder of your original submission or send using the same mode as initial submission.

If you have any questions, contact the AMCIRB at irb@albertus.edu . Please include your project title and IRB Project Number in all correspondence with the IRB.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Albertus Magnus College Institutional Review Board's records.

700 PROSPECT STREET, NEW HAVEN, CONNECTICUT 06511

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Albertus Magnus College

Advisor: Rebecca Arnold, Ph.D., ATR-BC
Clinical Coordinator, Master of Arts in Art Therapy and Counseling Program
Associate Professor
Albertus Magnus College

Reader: Hilda Speicher, Ph.D.
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Albertus Magnus College

Reader: Ragaa Mazen, Ph.D., NCC
Curriculum Consultant
Former Director of Master of Science in Human Services
Albertus Magnus College

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Abstract

The present research study investigated the relationship between global indicators in the Person Picking an Apple from a Tree (PPAT) projective art assessment, problem solving skills, and birth order. A total of 38 participants were administered the PPAT assessment, 20 first born and 18 last born subjects. The rating manual Formal Elements of Art Therapy (FEATS) was used with a list of global image indicators of problem solving in a participant's art. Attributes inherently present in sibling positioning were applied as evidenced from previous theoretical literature and research. The rating scales included identifying indicators and elements found in the drawings of first born or last-born individuals. Two Art Therapy trained professionals rated the PPAT drawings. Indicators and characteristics of birth order found in the assessments were used to determine if a participant is first born or last born. Results demonstrated a positive relationship between PPAT birth order indicators, PSI scores and a participant's true birth order.

Problem-Solving Skill Prediction in the Context of Birth Order Using the Projective Art Assessment Person-Picking-An-Apple-From-A-Tree

Therapists and counselors are constantly adapting and evolving their practices and applications of assessment and treatment based on the latest information of best practices from emerging research (Locher et al., 2019). Humans are an ever-evolving species; therefore, awareness of current research is essential in clinical practice (Stock, 201me8). Birth order theory, first developed by Alfred Adler (1927), considering the influence of when someone was born on internal structuring for skills, abilities, motivations, and relationships. Recent findings have further expanded how art therapy interventions may have the ability to influence and predict behaviors and attitudes related to birth order. Assessments like the Birds Nest Drawing (Kaiser, 1996) and the House Tree Person (Buck, 1948) used in studies have successfully predicted relationships between the indicators in art and an individual's birth order (Bell 2016; Collins 2000).

Birth Order

Birth order theory was the first of many regarding family dynamics in which birth order influences an individual's personality and traits (Adler, 1956). Initially, Adler (1927) theorized that an individual will hold a particular set of traits related to the order in which the person was born into a family, and that these traits are inherently present in any individual. More specifically, Adler’s study of social and human needs theorized that the relationships among siblings will structure and form future relationships.

Furthermore, Adler (1956) argued that the traits learned from children splitting attention between parents will also influence the traits they develop in future relationships as demand and motivation for an individual’s situation are negotiated. The environment in which a person is raised and the order in which that individual is born related to one’s sibling creates circumstances for an individual to strengthen and practice certain character traits. The competition for attention becomes a socially ingrained behavior as individuals seek out connection to others based on desiring favor from the parents (Geison, 1969; Lui, 2008; Sulloway, 1996). Character traits that have been attributed to birth order are also believed to be inherited or genetically linked (Adler, 1956). Sulloway (1996) reported findings of eldest first-born children to be more likely to align with more structured authority and authority figures; whereas children born later in the birth order and last tended to be more resistant to the ideas of authority.

The conclusion supports Adler’s (1927) position regarding birth order theory is the theoretical framework of individual psychology which focuses on a person's own specific experiences and perceptions and how these influence further life experiences. This theoretical model suggests that each individual has a soul that exudes psychic energy and expression in early developmental stages of childhood that will also manifest their entire lives. The individual psychology theory follows the school of thought that an individual’s psychic energy is present and active in day-to-day life. However, the manner in which an individual embraces this energy can be entirely accepted by the individual or only partially accepted. Adler further suggested that the traits and characteristics inherent in the individual’s birth order are concrete, applicable to all humans, and provide an understanding of any given individual.

Conflicting with Adler (1956) and Sulloway’s (1996) views, recent research claims the personality attributes related to one's birth order are not fixed and can in some cases have the flexibility to be influenced by other influential factors in daily experiences and family dynamics

(Punch, 2008). The above author argued that birth order hierarchy, as a social construct, is common among siblings and suggested it is also common for that hierarchy to be manipulated by children in order to be flexible in meeting one's needs. For example, a motivation to sway parental opinion to gain favor may cause siblings to compete and manipulate traits attributed to birth order to secure desires.

Problem-Solving

Problem-solving is a trait that has been attributed to certain positions in birth order. Adler (1956) theorized that eldest siblings tend to display clearer signs of problem-solving strategies; whereas other positions in birth order lack the inherent ability for problem-solving (Su et al., 2014). Problem-solving is a skill used consistently by an individual’s everyday life when faced with unsatisfactory situations and used in order to find a solution (Dostal, 2015). It represents the individual's ability to be aware of and perception of obstacles, having motivation to solve the issue created by the obstacle, and implementing problem-solving strategies. However, to act, an individual must first become aware of the problem and further analyze to speculate the source of conflict in order to formulate a thoughtful approach to addressing the specific variables of the problem (Dostal, 2015).

Tallman et. al (1993) offered a decision-making model in relation to problem solving. In this model, problem solving is organized into three groupings which identify different reactions to conflict. The first group is based on skills and coping mechanisms an individual possesses and utilizes to alleviate obstacles that are deemed problematic. The second group identified solution-focused resolutions to analyze, plan, and develop a solution based on information gathered from the problem. The third group largely focuses on a thoughtful approach to address the different variables of said problem (p.165).

Research supports that birth order has influence on the way someone approaches problems. Ram and Ross (2001) found correlations between sibling pairs who had positive relationships were more likely to come to mutual agreements and find resolutions that fit their particular situation. Conversely, sibling dyads who did not reach agreements and problem solve tended to have a more negative relationship and did not effectively negotiate a resolution. Older siblings were more likely to negotiate, solve problems, and gain benefit in agreements. In addition, they are more likely to display emotional mastery and analysis in problem-solving and think more dynamically about negotiations (Ram & Ross, 2001). The findings of the two researchers support claims that certain traits can be attributed to the order of birth, such as eldest siblings having the ability to problem solve and the youngest sibling not being as innately strong in the same skill.

An awareness of the problem is the first step towards approaching and finding a solution (Dostal, 2015). Using child development theories (Adler, 1956), a child's entire life, relationships and personality is scaffolded around influences from when they were a child interacting with their immediate family and siblings. Tallman et. al (1993) further breaks down the distinct categories of problem-solving research done thus far, but there is a lack of research in the variables that influence how an individual's problem-solving skills and coping mechanisms are developed. Moreover, there is limited research to support claims made suspecting a connection between problem-solving and birth order.

Art Therapy Assessments

Art therapy assessment is a psychotherapeutic modality that uses art as its main art therapeutic approach. It can be used with an array of populations regardless of age, ethnicity, class, gender, language, or any other global factors. Art is a multifunctional tool that can be applied in both therapeutic interventions as well as assessments by gathering diagnostic indicators (Handler, & Thomas, 2014; Horovitz, & Elgelid, 2014). Art therapy uses images to work with individuals, groups, and families in treatment. It is useful to aid with concepts like processing information and problem-solving both in treatment and assessment practices. According to Moon (2016), art therapy is a meta-verbal modality that does not rely solely on one's ability to converse verbally but provides and individual to create and address strong emotions stemming from the unconscious which may be unavailable to a person's immediate awareness. In ideal circumstances and under conditions that allow for immersion, art therapy techniques and assessment provide opportunities for one's unconscious to be activated (Chilton, 2013).

Art therapy often uses diagnostic assessments as part of treatment. Clinicians who are not trained in art therapy may avoid art-based assessments on the principle that they are not clear and definitive in measuring characteristics. Trained art therapists may prefer art assessments due to the intuitive facilitation that diagnostic art may have. This includes how the product can offer metaphor and how clients interact with the art (Groth & Wright, 2016). Kaplan (2003) suggested the use of art diagnostically to measure global indicators can provide clinically relevant information. Especially when used in combination with the art making process and the reflections from the client. Art assessments can be an invaluable information gathering tool when used by trained professionals in the initial stages of creating a treatment plan for an individual.

Some clinicians have reservations about using art-based projective assessments based on the inconsistent reliability and validity, varying standards of administration, scoring, poor test-retest reliability and an overall lack of research supporting diagnostic validity (Groth-Marnat 2016; Hunsley et al., 2003; Kahill, 1984; Kaplan 2000; Lilienfeld et al., 2000; Roback, 1968;

Swenson, 1957/1968). Concerns can be addressed by increasing training of individuals for rating diagnostic scores and understanding global indicators and formal elements in the image (Gant, 2011).

Person Picking an Apple from a Tree (PPAT)

The Person Picking an Apple from a Tree (PPAT) in its early form was first used by Viktor Lowenfeld (1939) in his developmental studies of children's spatial relationships and awareness. At the present time, the PPAT is widely used in practice and research by art therapists, clinicians, and educators to evaluate an array of functioning including behavioral, cognitive (Bat Or, 2014; Roth et al., 2020), and relational (Bat Or & Ishai, 2016; Bat Or & Ishai, 2019). Specifically, the PPAT has been researched to predict its ability to assess problem-solving skills (Bat Or, 2014).

The PPAT is often scored using the Formal Elements of Art Therapy Scale (FEATS) developed by Gantt and Tabone (1998). The FEATS was created out of the need to create a valid and reliable scoring system for use specifically in art therapy. In addition, it was designed to specifically correlate with the Diagnostic Scoring Manual (DSM). The FEATS was validated using the PPAT and has consistently predicted scores that meet criteria with diagnostic materials in the DSM (Gantt, 2009; Pénzes et al., 2020; Rockwell & Dunham, 2006). Furthermore, the FEATS can be used both as a therapeutic intervention and as a diagnostic assessment with a wide range of individuals regardless of ethnicity, age, education, gender, treatment status, etc. (Gantt, 2009; Gantt,2015; Gantt & Tabone, 1998; American Psychiatric Association, 2022).

Other Diagnostic Indicators in Art Therapy

A research study using artistic mediums and expressions has the unique ability to utilize art in a way to gather diagnostic criteria. Erasing in particular is valuable in art making in general. Recent studies support theories of correlation between erasing and problem solving in art (Kozbelt 2008). Effects and applications of erasers are present in many art therapy assessments such as The Levick Emotional and Cognitive Art Therapy Assessment (LECATA) (Levick, 1983), Kramer Art Assessment (Kramer & Schehr 1983), and Draw-A-Person-In-The-Rain (DAPR) (Verinis, Lichtenberg & Henrich 1974). Erasers or other forms of self-correction are utilized in art therapy to assess information and interventions for reduction of anxiety, stress, and depression (Sion et. al 2023).

Summary

The goal of this present research is to fill the gap in current literature by addressing the topic of whether first-born children possess stronger problem-solving skills than their younger siblings. By using intentional art mediums and studying links between birth order and problem-solving skills it is hoped that this research would add new supporting evidence to theoretical claims made on birth order and the specific traits that correlate. Art has the ability to detect an individual's unintentional indicators of problem solving *(*Kozbelt, 2008). In addition to what is gathered in an individual's self-reports.

It is hypothesized there will be a significant relationship between a participant’s problem-solving skills and the graphic indicators found in their PPAT assessment in relation to the participant’s birth order, older siblings will show greater problem solving in the PPAT images than younger siblings.

Method

Participants

A convenience sample was recruited for this study, 38 participants. For the sample, about half said they were the youngest siblings (*N*=18) and half said they were the oldest siblings (*N*=20). Eligible participants were adults 18 years of age or older who identify as either the youngest or oldest sibling in their biological families. Stepchildren, only children, and middle children were excluded from participation in this study. Attempts were made to recruit participants from diverse backgrounds. They were recruited to participate in the study using snowball sampling, word of mouth, and posted flyers (Appendix A). All had to disclose their race described as white/ Caucasian (92.3%), one person did not answer. All who reported their ethnicity described as non-Hispanic/ Latinx (97.4%) and three did not answer. There were 24 women and 14 men, and one person did not answer. Age ranged from 19- 68 years old (*M*=33.79, *SD*= 12.52).

There were two participants from out of state, and one from Canada. Another participant disclosed being legally blind during the art making portion of the research but reported it does not impact the art creation and self-identified as an artist. Out of all participants, there were two pairs of siblings.

Instruments

Problem Solving Inventory

The Problem-Solving Inventory (PSI) developed by Heppner and Peterson (1982) is a 35-item measure with a 6-point Likert- type scale, ranging from 1 *(strongly agree)* to 6 *(strongly disagree)*. The scale formally measures individuals' perceptions of their everyday problem-solving skills via three subscales. A general index of problem-solving appraisal is calculated by summing all items for a total score. A lower score is considered more functional for problem-solving (Heppner & Petersen, 1982) and a higher score indicates more difficulty in problem solving. The PSI has strong test-retest reliability for all of its subscales *(r*=. 83-.88), as well as its total score *(r*=.89; Heppner & Petersen, 1982). The scale also has solid construct validity, with its total score being significantly correlated with the Level of Problem-Solving Skills Estimate Form *(r=.46, p<.001).*

Formal Elements of Art Therapy Scale

The Formal Elements of Art Therapy Scale (FEATS) is used to measure the formal elements of art images (e.g., line, color, form, and use of space) that depict problem-solving skills within the Person Picking an Apple from a Tree (PPAT) art directive (Gantt & Tobone, P1998). The FEATS scales are rated on a Likert- type scale, ranging from 0-5 with half-point increments. The FEATS measures the following 14 scales: prominence of color, problem-solving, space, color fit, developmental level, integration, implied energy, details of objects and environment, logic, realism, line quality, perseveration, rotation, and person. The FEATS is a valid and reliable assessment of the PPAT art directive, as evidenced by studies conducted correlating the FEATS with diagnostic criteria in the DSM (Gantt, 1990). The PPAT is a single projective art assessment which has unlimited time allowing the individual as much time to complete the image as needed (Gantt & Tabone, 1998). For the purpose of the present study the following scales were used; integration, problem- solving, details of objects and environment, and person.

Materials

The original PPAT assessment (Gantt & Tobone, 1998) requires a set of 12 MR. SKETCH ™ scented watercolor markers in black, brown, orange, yellow, red, hot pink, magenta, purple, turquoise, dark blue, green, and dark green. The noted materials were used by the researchers based on their flexibility to adapt to the participant's needs. Since this was a virtual study, participants were asked to have on hand a single sheet of white paper 8.5 in. x 11 in. (21.59 cm x 27.94 cm) and a No. 2 pencil with an eraser. The color markers were not used.

These materials are selected due to equity in accessibility to all participants as well as material consistency. The adaptation in materials also allows for intentional research and data collection on problem solving and how an individual uses presented materials to complete assigned tasks. In this case how an individual uses the materials to complete a PPAT drawing.

Procedure

After IRB approval, participants were recruited through snowball sampling via social media, word of mouth and flyers (Appendix A) posted on a New England college campus. This study was conducted virtually, using the video conferencing platform of Zoom™, in hopes of targeting a larger and more diverse sample. Participants were selected based on an initial demographic survey. Individuals who met all eligibility criteria (including being at least 18 years of age and being either a youngest or oldest biological sibling) were contacted through email by the researcher to schedule a date and time for the virtual meeting to complete the PPAT under the guidance and observation of the researcher.

This researcher was alone and located in a secure room for virtual meetings. During the individual scheduled Zoom™ video conferencing sessions. Each participant was greeted by the researcher before being directed to open two password-protected Adobe Reader PDF informed consent (Appendix B), art release form (Appendix C) and demographic form (Appendix D) for review and signature. All forms were also verbally reviewed by the researcher with an opportunity for participants to ask any questions. Once signed, each participant was directed to email the forms back to the researcher. This information was stored on a separate password-protected digital folder from all other survey items/data within an external hard drive in order to maintain confidentiality. All data, including demographics, artwork, and PSI scale were coded to de-identify participants and were stored in a separate password-protected digital folder from other forms.

Each participant was then provided with instructions to gather the materials in front of them. The researcher stated, "Please draw a person picking an apple from a tree. Please do the best you can. You may take as much time as you like. Just do your best." Participants had as much time as they needed to complete the artmaking portion of the study as suggested by the assessment developers (Gantt & Tobone, 1998). After completing the image, the participant was instructed to take a well-lit picture of the image in its entirety (i.e., not cropped) and send it to the researcher over email. The participant was then directed to a Google form™ to complete the PSI scale. The researcher at that point provided a debriefing form (Appendix E) through email and answered any questions the participant had at that time regarding the research. Lastly, the researcher thanked the participant and logged off of the platform.

The researcher recruited three professional art therapists to investigate the interrater reliability and unexpectedly one became unresponsive, therefore resulting in the research functioning with only two raters. The researcher separately trained the two raters who were blind to conditions for all 14 FEATS manual scoring on the indicators. Intra-class correlation coefficients to assess the inter-rater reliability of the FEATS was then conducted. With adaptations to the PPAT materials the results were predicted to indirectly influence the FEATS and were further discussed with the two selected raters.

Results

Reliability of the FEATS and the PSI

The PSI scores ranged from 45 to 117 (*M*=82.95, *SD*= 16.12). To test inter- rater reliability of raters on the FEATS, intra-class correlation coefficients were calculated. The correlations range from -.01 to .92 with most .60 or higher and are presented in Table 1. For the purpose of this research, analyses focus on integration *(r*= .68), problem- solving *(r*= .61), details of object and environment *(r*= .64) and person *(r*= .83). To establish internal consistency reliability of the PSI for this sample a Cronbach's alpha was conducted *(a*=.85) and the consistency is high.

Hypothesis Tests

An independent *t*-test was performed on participants' PSI scores comparing eldest siblings and youngest ones. Oldest siblings *(M*= 83.25, *SD*= 17.65*)* did not show significantly different scores on the PSI than youngest sibling participants *(M*=82.61, *SD*= 14.75, *t* (36) = 0.12120, *p*= .452 (*one tailed).* Cohen's *d* (*d*= .039) shows no effect.

A series of independent t tests were then conducted on the FEATS scales. With the ample amount of data collected and number of tests conducted it should be noted that there is a possibility that some findings are due to chance. The statistical power was not present to support the conduction of many small *t*-tests without a risk of Type 1 error. The four scales of focus were; FEATS scale 5 Integration, FEATS scale 8 Problem- Solving, FEATS scale 10 Details of Objects and Environment, and FEATS scale 12 Person.

Regarding FEATS scale 5 Integration, oldest siblings were hypothesized to depict more integrated images whereas youngest siblings would be less integrated. Findings are statistically significant, and those who are the oldest sibling are higher on the FEATS Integration *(M*= 3.75, *SD*= 0.87*)* than those who are the younges*t (M*=3.19, *SD*= 0.88*), t (36)* = 1.96, *p*= .029 *(one-tailed)*, and the effect size is medium (*d*= .636).

For FEATS scale and Problem- Solving as expected images depicted more reasonable solutions in the PPAT assessments for the oldest siblings *(M*= 3.77, *SD*= 1.02) than the youngest siblings (*M*= 3.32, *SD*= 1.02), although this effect is not statistically significant *t* (36)= 1.22, *p*= .115 (one- tailed) and the effect size is small *(d*= .398). The hypothesis is only partially supported.

For FEATS scale 10 Detail oldest siblings *(M*= 3.01, *SD*= 1.04) did not provide more details than the participants that were youngest siblings *(M*=2.97, *SD*= 1.12). Data shows essentially no difference, *t* (36) = 0.12, *p*= .455 (one- tailed). There is no effect *(d*= .037*)*.

For FEATS scale 10 Person, oldest siblings (*M*= 3.44 *SD*= 1.08) provide similarly realistic depictions of people to those of the youngest sibling participants (*M*=3.51, *SD*= 0.71). Data shows essentially no difference, *t (*36) = 0.25, *p*=.401 (one tailed). No effect was found (*d*= 0.082).

Exploratory Analysis

An additional exploratory correlation analysis was conducted to investigate more in depth the relationship between the number of siblings one has and a participant's PSI results. A Pearson *r* correlation was conducted and shows there is no correlation of PSI, problem solving ability and the number of siblings (r= -.145, p= .392, (two tailed).

Participants completed a demographics form detailing past art experience on which roughly half reported having experience with art (51.3%) and the rest reported not having any experience with art (46.2%).

Discussion

This validity study examined the relationship between problem-solving skills and graphic indicators found in the Person Picking an Apple from a Tree (PPAT) assessment in relation to birth order. It was hypothesized that first-born children would possess stronger problem-solving skills than their younger siblings would. Using the Formal Elements in Art Therapy Scale (FEATS), the PPAT images were rated by two professional art therapists. Although raters were asked to score all 14 scales of the FEATS, the full list of variables proved difficult to analyze. For instance, scale 1 Prominence of Color and scale 2 Color Fit were not applicable due to provision of alternate art materials (pencil/eraser) from the PPAT's required materials (color markers). A number of the indicators showed unacceptable low rater reliability. This may be due to having trained them separately rather than together to achieve rater agreement. Therefore, the scoring of indicators in the artwork was left to intuition, personal experience, and individual perceptions held by the raters. Arguments could be made that evaluative skills are presumed to be part of an art therapist's clinical practice; however, this was not evident in how raters for this study viewed and interpreted all 14 scales of the FEATS. The four scales selected for analysis provided more focused results when compared to rater input and level of reliability.

The results of this study display mixed findings in comparing oldest and youngest sibling participants on the scales of 5 Integration, 8 Problem-Solving, 10 Details of Objects and Environment, and 12 Person. For the indicator more closely aligned with problem- solving skills, FEATS Problem Solving, the hypothesis was partially supported in that older siblings depicted more reasonable solutions to the PPAT assessment, though the effect was small. No differences were found for Details or Person. However, statistical significance was found in integration with oldest siblings showing more coherence in the imagery overall.

An informal review of the artwork provided similar conclusions regarding graphic indicators when comparing eldest and youngest siblings. For example, Figure 1 was created by the oldest sibling of related participants and offers a direct comparison of images between the two. The differences in the images seem to present a clear example of how all four FEAT scales were displayed graphically in the PPAT. Integration is described by Gantt and Tabone (1998) as coherence between the person, tree, and apples and how they relate to each other (p. 34). A high level of integration is suggested in the image created by the eldest sibling. With more detail used to depict bark of the trunk and individual leaves on the tree, tufts of grass on the ground, and roots of the tree. The person is also fully detailed with clothing, a hat, and a realistic reach to pick the apple from the tree. A basket holding already picked apples is also included. Although there is no ladder present, the addition of a mound on which the person is standing offers height for picking the lowest apples. This may suggest the participant is able to effectively problem-solve by using elements of the environment. In comparison, the youngest sibling (Figure 2) of this pair included a ladder in order to gain access to the apples, along with the presence of a basket to hold ones already picked. Of important note is the developmental level of this drawing which was created by a 25-year-old. Based on the image's depiction of the schematic stage (Lowenfeld, 1947), certain elements such as The Person, Details, and environment are not fully realized for the sake of integration of the image. These images, in particular, provide an important comparison not only between artistic developmental levels of the siblings, but also in how integration and problem solving are suggested using the PPAT and FEATS in evaluating these characteristics.

Conversely, Figure 3 depicts poverty in all of four scales of Integration, Problem Solving, Details, and Person as scores reported from raters reflect. A lack of integration is evidenced by elements in the image being depicted close together but not necessarily related or interacting with each other, as there is an ambiguous relationship between the image elements and the assessment instructions of “person picking an apple.” The FEATS Problem-Solving scale scored poorly due to the person in the image not meeting FEATS criteria as “the person does not have the apple in hand, or there are no apples in a container or on the ground” (Gantt and Tabone, 1998, p. 18). The items are identified as tree, person, and apple but there is no depiction of any apples having been picked, or in the person's hand. Details of object and environment score low as well due to the perceived objects again being identifiable as a person, apple, and tree but no further detail is included into the overall image, or small details on the main objects. The person remains a simple stick figure, the tree a basic trunk with a rounded form for the top and a small, outlined apple. Finally, criteria for the person scale score low as the depiction meets expectations for a stick figure with the additions of facial features and the representation of hands. After drawing and PSI completion, the participant made statements such as, “Should I draw a ladder? Well, I don't know if I can't reach the apple yet,” and “It's interesting when I was answering the questions [on the survey], how much the task you gave me of drawing something that (problem-solving) came into play.” Insufficiencies in presentation of the four scales in this particular drawing could indicate a more concrete thought process or need for external support when a problem arises. It is important to note that the individual who created this image reported a lack of formal art experience and also verbalized that this person “could not draw” prior to completing the drawing task. The information shared from the participant indicates problem solving behaviors, approaches and thought patterns that were not evident on the assessment. This supports criticisms made on the PPAT by Gantt and Tabone (1998) and other researchers who claimed individuals with art experience score higher than those without. Those with art experience may be more comfortable in the creative elements of expression and possess the techniques to more clearly depict the image as instructed.

The numerous limitations of the present study include the most significant issue as having raters who were unfamiliar with the FEATS for scoring. Although three raters were anticipated, only two were available once the images were collected. Additionally, having raters score the entire 14-point scale of the FEATS was a lengthy process that may have been overwhelming, causing discrepancies in the data. Additional training would have limited and potentially controlled these unknown factors that likely influenced scores. It is further suggested that stronger reliability may have been achieved through not only the use of a scoring manual or training, but also having raters focus solely on elements of the FEATS that were relevant to the hypothesis (such as the problem-solving scale) and training them together until they appeared to have high agreement.

For the sake of accessibility and familiarity, and due to sessions being conducted virtually, required art materials were adapted from the traditional PPAT color markers to pencil and eraser. This was another significant limitation to the study leaving several key scales unobtainable. Although the intention was to provide an opportunity for erasures as indicators of concrete problem-solving behaviors, this adjustment proved to be detrimental to the FEATS scoring. In order to continue developing consistent research and data on projective art assessments used in birth order studies, considerations should be made for future studies to be intentional in areas of material choice in relation to the manual.

Future investigations should include more robust rater training and focus on specific scales of the FEATS with intention in scale choice, since this study collected an excess amount of data that did not focus on the research question. Raters should be trained together in one or as needed multiple training sessions until confidence in the raters practice scores and agreement on rated items is demonstrated. Additionally, the use of materials, as designated by the assessment, would also be an important remedy. Collecting qualitative data from participant insights into the art process and verbalizations about problem solving in general may also yield more statistically significant data.

The use of the Person-Picking-an-Apple-from-a-Tree (PPAT) assessment, when used in combination with the Formal Elements in Art Therapy Scale (FEATS), has shown previous significance as an evidence-based art assessment. However, the art therapy profession still lacks focused research on birth order in relation to diagnostic indicators found in PPAT drawings. The basis for this study was to add empirical research regarding problem solving and birth order. The pairing of the PPAT and FEATS provides a non-confrontational presentation of a problem that can elicit an understanding of how someone forms and utilizes effective or nonviable problem-solving skills. Considering the developmental level and art experience (acquired or formal training) of oldest and youngest siblings may also provide further insight into this phenomenon.

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Table 1

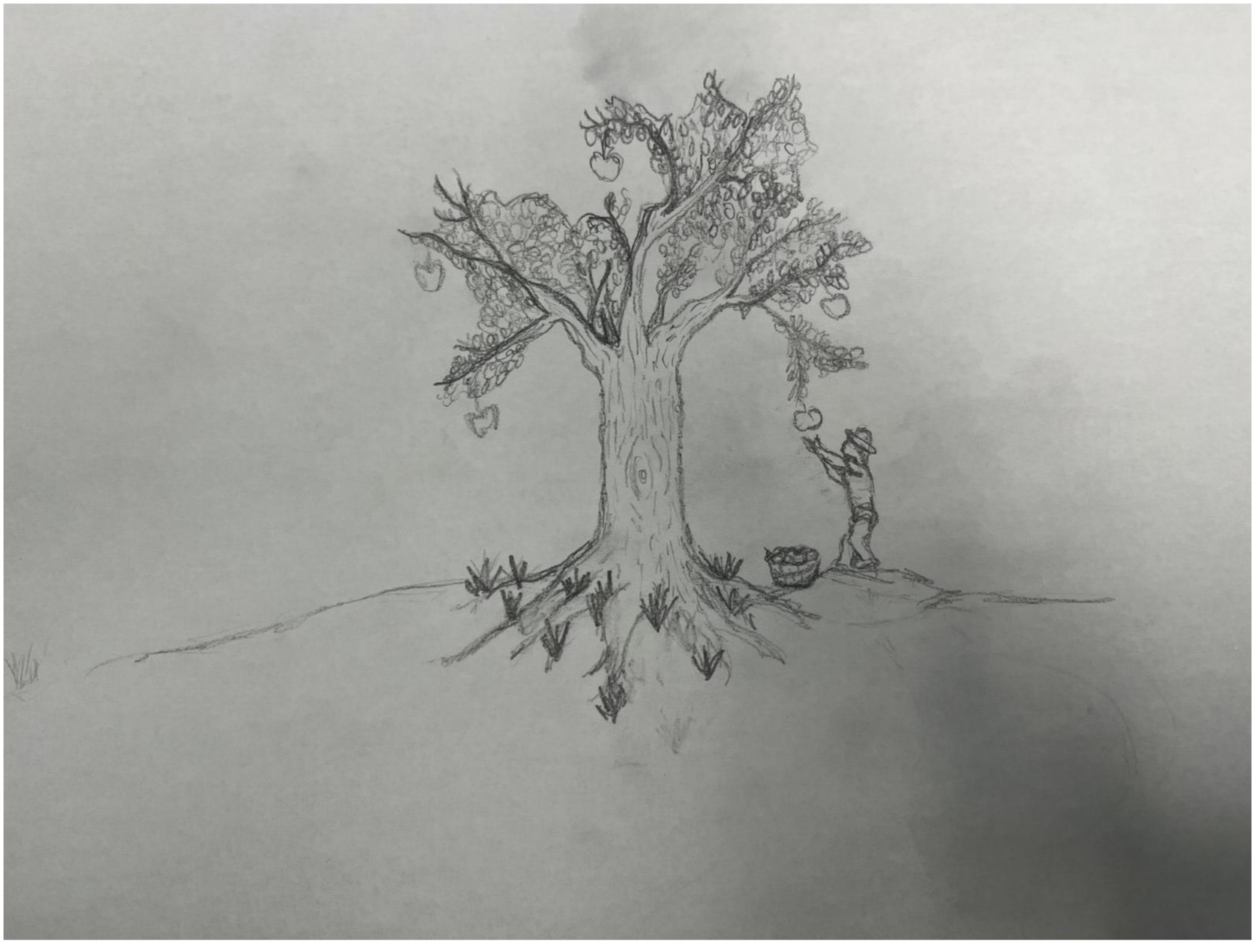
Inter-rater Reliability for FEATS Indicators

FEATS Scale (Scale Number)	***r***
Space (F4)	.92
Integration (F5)	.68
Logic (F6)	.19
Realism (F7)	.87
Problem - Solving (F8)	.61
Developmental Level (F9)	.88
Detail (F10)	.64
Line Quality (F11)	.25
Person (F12)	.83
Rotation (F13)	.52
Perseveration (F14)	.01

Note: Intra- class correlation coefficients

Figure 1

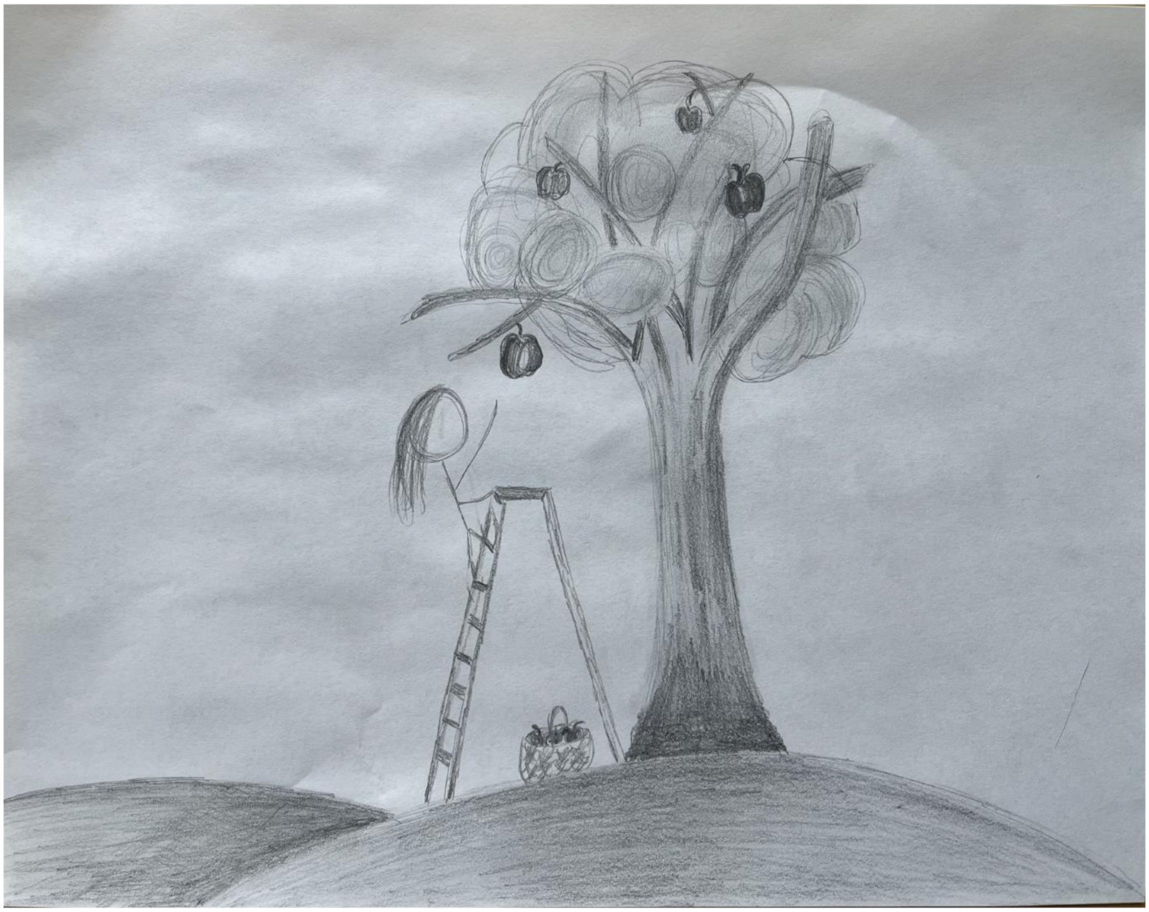
Person Picking and Apple from a Tree



Note: A PPAT drawing by an older sibling 29-year-old Caucasian woman who displays graphic indicators of problem solving.

Figure 2

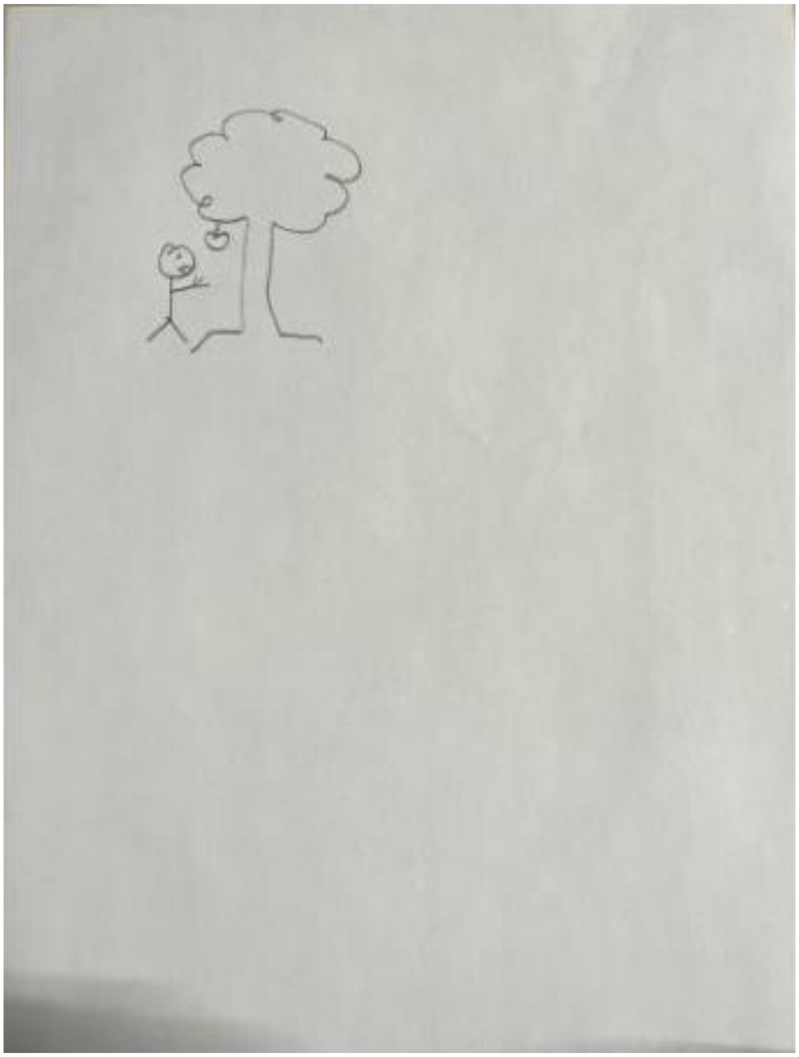
Person Picking and Apple from a Tree



Note: A PPAT drawing by a younger sibling 25-year-old Caucasian woman who displays graphic indicators of problem solving.

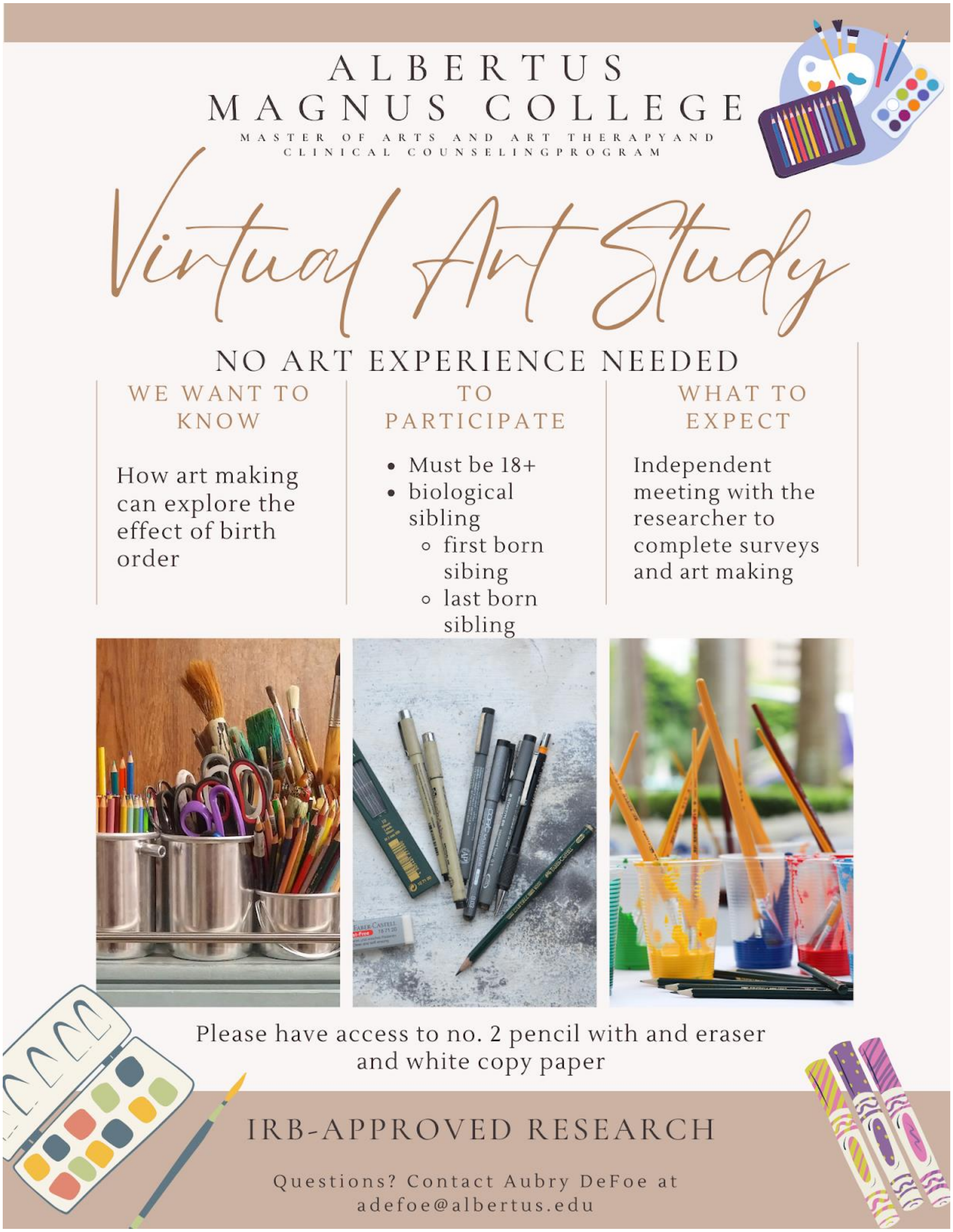
Figure 3

Person Picking and Apple from a Tree



Note: A PPAT drawing by a youngest sibling 34-year-old Caucasian man who displays poor graphic indicators of problem solving.

Appendix A



ALBERTUS
MAGNUS COLLEGE

MASTER OF ARTS AND ART THERAPYAND
CLINICAL COUNSELINGPROGRAM

Virtual Art Study

NO ART EXPERIENCE NEEDED

WE WANT TO KNOW

How art making can explore the effect of birth order

TO PARTICIPATE

- Must be 18+
- biological sibling
  - first born sibling
  - last born sibling

WHAT TO EXPECT

Independent meeting with the researcher to complete surveys and art making

Please have access to no. 2 pencil with and eraser
and white copy paper

IRB-APPROVED RESEARCH

Questions? Contact Aubry DeFoe at
adefoe@albertus.edu

Appendix B

Informed Consent Form

This study is being conducted as part of the requirements for the Master of Arts in Art Therapy and Counseling degree at Albertus Magnus College. This study aims to explore the connection between art-making and problem-solving for oldest and youngest siblings. During this study, you will be asked to first complete consent forms, answer demographic questions, followed by participating in artmaking, and completing a problem-solving questionnaire

Please note that your art-making abilities are not a factor in this study. All information collected will be confidential. To maintain confidentiality, the artwork created and your answers on the survey during this study will be numbered, and your name will not be connected to the work in any way. You will be told in more detail at the end of this participation session about the purpose of the research.

Potential risks involved with participation in this study may include frustration or negative feelings from the art-making process or questions on the survey. The benefits of participating in this study include assisting a graduate student in the completion of her thesis requirement, as well as contributing to research on art therapy. You may also enjoy the art making portion of the activities.

Participation in this study is completely voluntary, and you are able to withdraw at any point without penalty. This study has been approved by the Albertus Magnus College Institutional Review Board (IRB).

Please inform the researcher if you have any known allergies to art materials. If you have any questions or concerns about this research, you may contact the following individuals:

Investigator:

Aubry DeFoe adefoe@albertus.edu

Thesis Advisor:

Rebecca Arnold rarnold@albertus.edu

Institutional Review Board contact: IRB@albertus.edu

By signing this form, you

- acknowledge that you are 18 years of age or older
- understand the nature of the study described above
- had your questions addressed/answered
- agree to participate

Thank you for your interest in participating in this study on the connection between artmaking and birth order for oldest and youngest siblings. To be eligible to participate you must be either the oldest or youngest sibling in your family. While we recognize that families include members who are related in different ways, for the purpose of this study we are only biologically related. Are you either the youngest or oldest sibling in your biological family?

_____ Yes

_____ No

Print name ____________________________________

Signature ______________________________________ Date ______________________

☐ I have received a copy of this form to keep for myself.

Appendix C

Art Image Release Form

You are being asked to allow the investigator to photograph your artwork to be used for the research study.

Please note that the photographs of your artwork will remain confidential. Your name will not be connected with your artwork, and photographs of the artwork will not include any identifying information. Photographs will only be taken with your consent and used beyond this research for the purposes listed below.

I agree to have my artwork photographed without identifying information for the following purpose(se): (Please check all that apply)

- ☐ For educational and training purposes
- ☐ Presentation at a professional conference
- ☐ Publication in a professional journal
- ☐ I DO NOT agree to share images of my artwork beyond the research study for the above purposes

I hereby give consent, as noted above, for the use of my photographed artwork.

Name (print): ________________________________

Signature: ________________________________ Date:________________________________

Please note that once images have been disseminated for publication or in a presentation setting, they may be difficult or impossible to recover should you change your mind.

☐ I received a copy of this form for my records.

Appendix D

Demographic Questionnaire

1.) What is your age? Fill in the blank ______________________

2.) How do you best identify your race (choose all that apply)?

- ☐ Asian
- ☐ Black/African American
- ☐ White
- ☐ American Indian
- ☐ Alaska Native
- ☐ Native Hawaiian
- ☐ Other Pacific Islander
- ☐ Prefer not to Answer
- ☐ Self-describe ____________

4) How do you identify your ethnicity?

- ☐ Hispanic/Latinx
- ☐ Non-Hispanic/Latinx

3.) What gender do you identify as?

- ☐ Male
- ☐ Female
- ☐ Nonbinary
- ☐ Prefer not to answer
- ☐ Self-describe: ______________________

4.) Do you have any art experience?

- ☐ Yes
- ☐ No

6.) How many biological siblings do you have, including “half” siblings (this count does not include you)?

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5 or more

7.) Are you the youngest or the oldest child?

- ☐ Oldest

- ☐ Youngest

8.) What is the age gap between the sibling closest in age to you and the sibling furthest in age from you?
Sibling 1 (Closest) _____________
Sibling 2 (Furthest)_____________

10.) Do you also have any step or adopted siblings?
- ☐ No
- ☐ Yes

Appendix E

Debriefing Form

Thank you for your participation! The purpose of this study was to explore if a well-known art therapy directive, the Person Picking an Apple from a Tree assessment, will depict problem-solving skills for youngest and oldest siblings. The questionnaire you completed measured your perceived problem-solving skills, and the art directive was specifically designed to visually depict one's problem-solving skills, among other traits. It was hypothesized that there would be a significant relationship between participants' scores on the Problem-Solving Scale and graphic indicators of PPAT art.

Previous research offers preliminary findings on the efficacy of PPAT to predict problem-solving in the participants (Bat, Ben, Shalev 2022). The questionnaire you were given measures your perceived problem-solving skills and the art directive were specifically designed to visualize one's problem-solving skills among other traits. The hypothesis is that there will be a significant relationship between a participant's PSI score and the graphic indicators found on the same participant's PPAT assessment.

The risks of this study were minimal. Most participants experience a sense of enjoyment from engaging in the art activity. However, some individuals may feel mildly frustrated by the art materials or art-making process. Most participants enjoy answering questions about themselves, however, some individuals may experience mild negative feelings in response to some of the items in the questionnaire.

However, if you experienced anything beyond a mild, transitory negative response, please feel free to discuss your feelings with the researcher. If you need more support beyond that, please contact one of the community mental health services:

- Cornell Scott – Hill Health Center Dixwell at (203) 503-3000
- Connecticut Mental Health Center at (203) 974-7300If you are a student at Albertus Magnus
- College, you may contact the College’s Counseling Center at (203) 773-8149 or counseling@albertus.edu

If you would like to know the results of this study, please provide your email address to the researcher. Do note that results can only be provided in aggregate.

If you would like to learn more about art therapy, please visit the American Art Therapy Association at www.arttherapy.org. For more information about the Person Picking an Apple from a Tree art assessment, see the resources cited below:

- Bucciarelli, A. (2011). A normative study of the person picking an apple from a tree

(PPAT) assessment. Art Therapy: Journal of the American Art Therapy Association, 28(1), 31–36.

- Gantt, L. (2015). The Formal Elements Art Therapy Scale (FEATS). In The Wiley Handbook of Art Therapy (eds D.E. Gussak and M.L. Rosal). https://doi.org/10.1002/9781118306543.ch54